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Specification and Drawings, as originally filed, with Application for Patent Serial No: **2,441,847**, on September 19, 2003, by **DIMPLEX NORTH AMERICA LIMITED**, assignee of Kristoffer Hess and Kelly Stinson, for "Flame Simulating Assembly".

Agent certificateur/Certifying Officer

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Date

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ABSTRACT OF THE INVENTION

A flame simulating assembly for providing an image of flames viewable by an observer from a front side of the flame simulating assembly. The flame simulating assembly has a simulated fuel bed, a light source for providing the image of flames, and a screen positioned behind the simulated fuel bed. The flame simulating assembly also includes a simulated interior fireplace wall positioned behind the screen. The screen is positioned in a path of light from the light source, so that the image of flames is projected onto the screen and is viewable by the observer. The front surface of the screen includes a substantially translucent portion disposed proximate to the simulated fuel bed, a substantially transparent portion disposed distal to the simulated fuel bed, and a transition portion disposed between the translucent portion and the transparent portion.

[WAT_LAW\98352\2]

FLAME SIMULATING ASSEMBLY

FIELD OF THE INVENTION

[0001] The present invention relates to a flame simulating assembly adapted for displaying an image of flames.

BACKGROUND OF THE INVENTION

[0002] Various types of flame simulating assemblies are known. One type of flame simulating assembly is intended to simulate flames in a real fireplace. For example, U.S. Patent No. 5,642,580 (Hess et al.) discloses a flame simulating assembly in which a screen having a partially reflective front surface is positioned behind a simulated fuel bed. The screen is also partially translucent, so that an image of flames projected onto a back surface of the screen can be seen by an observer positioned in front of the unit.

[0003] Known flame simulating assemblies have certain advantages over actual fireplaces, in which a combustible fuel (usually wood or coal) can be burned. Among other things, electric flame simulating assemblies can be used in an interior room (such as in a condominium building or a hotel) from which access to a chimney (i.e., for an actual fireplace) would be difficult. Also, and in particular, known flame simulating assemblies typically occupy less space than actual fireplaces.

[0004] However, because they are smaller, known flame simulating assemblies typically have somewhat less depth (i.e., distance from front to back) than ordinary fireplaces. Due to this, the overall effect presented by these flame simulating assemblies is often not as realistic as may be desirable. This is because the relatively smaller depth of the typical flame simulating assembly, as compared to the usual depth of a real fireplace, tends to undermine the overall effect sought to be created with the typical flame simulating assembly.

[0005] There is therefore a need for an improved flame simulating assembly adapted for displaying an image of flames.

SUMMARY OF THE INVENTION

[0006] In a broad aspect of the present invention, there is provided a flame simulating assembly for providing an image of flames viewable by an observer from a front side of the flame simulating assembly. The flame simulating assembly has a simulated fuel bed, a light source for providing the image of flames, and a screen positioned behind the simulated fuel bed. The flame simulating assembly also includes a simulated interior fireplace wall positioned behind the screen. The screen has a front surface adjacent to the simulated fuel bed. The screen is positioned in a path of light from the light source, so that the image of flames is projected onto the screen and is viewable by the observer. The front surface of the screen includes a substantially translucent portion disposed proximate to the simulated fuel bed, a substantially transparent portion disposed distal to the simulated fuel bed, and a transition portion disposed between the translucent portion and the transparent portion. The image of flames is partially viewable through the substantially translucent portion, and the simulated interior fireplace wall is viewable by the observer. The transition portion is partially translucent and partially transparent, so that the image of flames is partially viewable therethrough and said at least one simulated interior fireplace wall is viewable by the observer.

[0007] In another aspect, the flame simulating assembly has a front side opening into a cavity therein, and the flame simulating assembly is adapted for use with a simulated fuel bed located proximate to the front side. The flame simulating assembly has a light source for providing an image of flames, a screen positioned in the cavity, and a simulated interior fireplace wall positioned in the cavity behind the screen. The screen has a front surface proximate to the simulated fuel bed. Also, the screen is positioned in a path of light from the light sourc so that the image of flames is projected onto the screen. Th front

surface of the screen includes a substantially translucent portion disposed proximate to the simulated fuel bed, a substantially transparent portion disposed distal to the simulated fuel bed, and a transition portion disposed between the translucent portion and the transparent portion.

[0008] In yet another aspect, the translucent portion and the transition portion on the front surface of the screen are produced by the steps of providing a source of vaporized metal adapted for spraying vaporized metal onto the front surface so that the metal condenses thereon, providing a mask element configured to substantially prevent vaporized metal sprayed from the source from condensing upon the transparent portion of the front surface, positioning the mask element in a predetermined mask position relative to the source and the front surface of the screen, positioning the source in a predetermined source position relative to the mask element and the front surface so that vaporized metal is sprayable from the source onto the translucent portion and the transition portion of the front surface, and spraying vaporized metal from the source onto the front surface.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] The invention will be better understood with reference to the drawings, in which:

[0010] Fig. 1 is an isometric view of a preferred embodiment of the flame simulating assembly, including a simulated fuel bed and a screen positioned behind the simulated fuel bed;

[0011] Fig. 2 is a front view of the flame simulating assembly of Fig. 1;

[0012] Fig. 2A is a front view of the screen;

[0013] Fig. 3 is a cross-section of the flame simulating assembly of Fig. 1 taken along line 3-3 in Fig. 2, drawn at a larger scale;

[0014] Fig. 4 is an isometric view of another embodiment of the flame simulating assembly of the invention, drawn at a smaller scale;

[0015] Fig. 5 is a front view of the flame simulating assembly of Fig. 4, drawn at a larger scale;

[0016] Fig. 6 is a cross-section of the flame simulating assembly of Fig. 4 taken along line 6-6 in Fig. 5, drawn at a larger scale;

[0017] Fig. 7 is an isometric view of a screen having a front surface, with a mask element and a source of vaporized metal particles positioned relative to each other and to the front surface;

[0018] Fig. 8 is a front view of the screen, the mask element, and the source of Fig. 7, drawn at a larger scale; and

[0019] Fig. 9 is a cross-section of the screen, the mask element, and the source of Fig. 8 taken along line 8-8 in Fig. 7.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT(S)

[0020] Reference is first made to Figs. 1 – 3 to describe a preferred embodiment of a flame simulating assembly indicated generally by the numeral 10 in accordance with the invention. The flame simulating assembly 10 is for providing an image of flames (not shown) viewable by an observer (not shown) from a front side 12 of the flame simulating assembly 10. The flame simulating assembly 10 includes a simulated fuel bed 14, a light source 16 for providing the image of flames, and a screen 18 positioned behind the simulated fuel bed 14. As can be seen in Fig. 3, the screen 18 has a front surface 20 adjacent to the

simulated fuel bed 14. The screen 18 is positioned in a path of light 24 from the light source 16 so that the image of flames is projected onto the screen 18 and is viewable by the observer.

[0021] The flame simulating assembly 10 also includes a simulated interior fireplace wall 26 which is positioned behind the screen 18, as can be seen in Figs. 2 and 3. In the preferred embodiment, the front surface 20 of the screen 18 includes a substantially translucent portion 28, a substantially transparent portion 30, and a transition portion 32 located between the translucent portion 28 and the transparent portion 30 (Fig. 2A). As shown in Figs. 1 – 3, the substantially translucent portion 28 is disposed proximate to the simulated fuel bed 14 so that the image of flames is partially viewable through the substantially translucent portion 28. However, because the portion 30 is substantially transparent, the simulated interior fireplace wall 26 is viewable by the observer. In the transition portion 32, the front surface 20 is partially translucent and partially transparent, so that the image of flames is partially viewable therethrough, but also so that the simulated interior fireplace wall 26 is partially viewable therethrough by the observer.

[0022] Preferably, the translucent portion 28 is partially reflective, as well as translucent. An image of the simulated fuel bed 14 is then reflected in part in the translucent portion 28, thereby providing an illusion of greater depth of the simulated fuel bed 14 and enhancing the simulation of an actual fire in an actual fireplace.

[0023] In the preferred embodiment, the screen 18 additionally includes a back surface 34 positioned opposite to the front surface 20. Preferably, the back surface 34 is adapted to diffuse the image of flames projected thereon.

[0024] It is also preferred that the simulated interior fireplace wall 26 has a pattern 36 simulating firebrick thereon.

[0025] The simulated interior fireplace wall 26 preferably is a back wall (Figs. 1 – 3). In addition, the flame simulating assembly 10 preferably includes two simulated interior fireplace sidewalls 38, 40. Each of the simulated interior fireplace sidewalls 38, 40 extends from the back wall 26 forwardly beyond the front surface 20 of the screen 18. Preferably, the simulated interior fireplace sidewalls 38, 40 also have patterns 42 simulating firebrick thereon. In the preferred embodiment, the patterns 42 on the simulated interior fireplace sidewalls 38, 40 are positioned to be aligned with the pattern 36 on the back wall 26.

[0026] It is also preferred that the flame simulating assembly includes a flicker element 44 positioned in a path of light from the light source 16 to the screen 18 for causing light from the light source 16 to fluctuate, to provide the image of flames. In addition, the flame simulating assembly 10 preferably includes as well a flame effect element 46 for configuring light from the light source 16 to provide the image of flames which is projected onto the screen 18.

[0027] Preferably, the flame simulating assembly 10 includes a substantially vertical back wall 50, a top wall 52, a bottom wall 54, and at least two side walls 56, 58 defining a cavity 60. The cavity 60 has an opening 62 at the front side 12, so that the cavity 60 is substantially viewable from the front side 12 by the observer. The simulated interior fireplace wall 26 is positioned substantially opposite to the opening 62, and the interior wall 26 is adapted to simulate an interior of a fireplace. Preferably, the simulated fuel bed 14 is disposed in the cavity 60 proximal to the opening 62. As shown in Fig. 3, the screen 18 is positioned behind the simulated fuel bed 14 and in front of the interior wall 26.

[0028] In use, the flicker element 44 causes light from the light source (represented schematically by arrows A and B in Fig. 3) to fluctuate upon reflection thereof by the flicker element 44. In the preferred embodiment, the fluctuating light reflected by the flicker element 44 is configured by the flame

effect element 46 to form an image of flames which is projected onto the screen 18.

[0029] It can be seen in Figs. 1 – 3 that, because the image of flames is projected onto the screen 18, the image of flames appears directly behind and directly above the simulated fuel bed 14, thus providing a realistic simulation of flames in an actual wood or coal fire. The effect is also realistic because the image of flames is projected onto the screen 18, which is positioned in front of the simulated interior fireplace wall 26, i.e., corresponding to the position of flames in an actual fire vis-à-vis the back wall of an actual fireplace.

[0030] Additional embodiments of the invention are shown in Figs. 4 – 9. In Figs. 4 – 9, elements are numbered so as to correspond to like elements shown in Figs. 1, 2, 2A, and 3.

[0031] An alternative embodiment 110 of the flame simulating assembly is shown in Figs. 4 – 6. The flame simulating assembly 110 does not include a simulated fuel bed, but is adapted for use with a simulated fuel bed (not shown) which is located proximate to a front side 112 of the flame simulating assembly 110. The flame simulating assembly 110 includes a cavity 160, and also has a light source 116 for providing an image of flames and a screen 118 positioned in the cavity 160. The flame simulating assembly 110 also includes a simulated interior fireplace wall 126 positioned behind the screen 118. The screen 118 has a front surface 120 with a substantially translucent portion 128, a substantially transparent portion 130, and a transition portion 132 positioned between the translucent portion 128 and the transparent portion 130. The substantially translucent portion 128 is positioned, at least in part, at the bottom of the screen 120 – i.e., adjacent to the simulated fuel bed, if provided. The transparent portion 130 is positioned distal to the translucent portion 128.

[0032] Although the flame simulating assembly 110 is adapted for use with a separate simulated fuel bed, the flame simulating assembly 110 also could be

used without a simulated fuel bed. The image of flames is partially viewable through the translucent portion 128. However, because the portion 130 is substantially transparent, the simulated interior fireplace wall 126 is viewable by an observer (not shown) in the transition portion 132, the front surface 120 is both partially translucent and partially transparent, so that the image of flames is partially viewable therethrough, but also so that the simulated interior fireplace wall 126 is partially viewable therethrough by the observer.

[0033] It is preferable that the translucent portion 128 is partially reflective as well as translucent. Because of this, an image of the simulated fuel bed (if provided) is then reflected in part in the translucent portion 128, thereby providing an illusion of greater depth of the simulated fuel bed and enhancing the simulation of an actual fire in an actual fireplace.

[0034] As in the preferred embodiment, the simulated interior fireplace wall 126 is preferably a back wall. Also, the flame simulating assembly 110 preferably includes two simulated interior fireplace sidewalls 138, 140. Each of the simulated interior fireplace sidewalls 138, 140 extends from the back wall 126 forwardly beyond the front surface 120 of the screen 118. Preferably, the simulated interior fireplace sidewalls 138, 140 also have patterns 142 simulating firebrick thereon. The back wall 126 preferably has a pattern 136 simulating firebrick thereon, and, in the preferred embodiment, the patterns 142 on the simulated interior fireplace sidewalls 138, 140 are positioned to be aligned with the pattern 136 on the back wall 126.

[0035] The translucent portion 28 and the transition portion 32 on the front surface 12 of the screen 18 are preferably created as follows. As shown in Fig. 7, a source 180 of vaporized metal (not shown) adapted for spraying vaporized metal onto the front surface 20 is provided. Also, a mask element 182 is provided, to substantially prevent vaporized metal sprayed from the source 180 from condensing on the transparent portion 32 of the front surface 20. The mask element 182 is positioned in a predetermined mask position relative to the source

180 and the front surface 20, as shown in Figs. 7 – 9. The source 180 is also positioned in a predetermined source position relative to the mask element 182 and the front surface 20 so that vaporized metal is sprayable from the source 180 onto the translucent portion 28 and the transition portion 32 of the front surface 20.

[0036] The path of the vaporized metal sprayed from the source 180 onto the front surface 20 is schematically shown by arrows C and D in Fig. 9. The arrows identified as C in Fig. 9 represent metal vapor which is sprayed directly onto the front surface 20 to form the translucent portion 28. The arrows identified as D in Fig. 9 represent the metal vapor which is distributed over a portion of the front surface 20 to form the transition portion 32. As can be seen in Fig. 9, the transition portion 32 is in an area 184 on which vaporized metal condenses, spread out so that its concentration is not as great as in the translucent portion because the mask element 182 prevents spraying of the vaporized metal directly onto the area 184. As can be seen in Fig. 9, the mask element 182 also prevents vaporized metal from condensing in the transparent portion 30, formed in an area 186.

[0037] Preferably, the screen 18, 118 comprises glass. Alternatively, a suitable polycarbonate (such as plexiglas) or a suitable acrylic material can be used.

[0038] The vaporized metal is preferably produced by passing a relatively high electric current through a suitably prepared metal, such as aluminium. As is known in the art, the high current vaporizes the metal, i.e., changes the metal so that it is in a gaseous state. The vaporized metal can then be sprayed onto a surface which is at a lower temperature (e.g., the surface 20, at room temperature), causing the rapid "condensation" (i.e., solidification) of the vaporized metal on the cooler surface.

[0039] It will be evident to those skilled in the art that the invention can take many forms, and that such forms are within the scope of the invention as claimed. Therefore, the spirit and scope of the appended claims should not be limited to the descriptions of the versions contained herein.

W claim:

1. A flame simulating assembly for providing an image of flames viewable by an observer from a front side of the flame simulating assembly, the flame simulating assembly having:

a simulated fuel bed;

a light source for providing the image of flames;

a screen positioned behind the simulated fuel bed, the screen having a front surface adjacent to the simulated fuel bed;

the screen being positioned in a path of light from the light source, such that the image of flames is projected onto the screen and is viewable by the observer;

at least one simulated interior fireplace wall positioned behind the screen;

the front surface of the screen including:

a substantially translucent portion disposed proximate to the simulated fuel bed such that the image of flames is partially viewable through said substantially translucent portion;

a substantially transparent portion disposed distal to the simulated fuel bed such that said at least one simulated interior fireplace wall is viewable by the observer; and

a transition portion disposed between the translucent portion and the transparent portion, the transition portion being partially translucent and partially transparent, such that the image of flames is partially viewable therethrough and said at least one simulated interior fireplace wall is viewable by the observer.

2. A flame simulating assembly according to claim 1 in which the screen additionally includes a back surface positioned opposite to the front

surface, the back surface being adapted to diffuse the image of flames projected thereon.

3. A flame simulating assembly according to claim 1 in which said at least one simulated interior fireplace wall has a pattern simulating firebrick thereon.

4. A flame simulating assembly according to claim 3 in which said at least one simulated interior fireplace wall is a back wall, the flame simulating assembly additionally including at least two simulated interior fireplace side walls, each of said at least two simulated interior fireplace side walls extending from said back wall forwardly beyond the front surface of the screen, said at least two simulated interior fireplace side walls having patterns simulating firebrick thereon.

5. A flame simulating assembly for providing an image of flames viewable by an observer from a front side of the flame simulating assembly, the flame simulating assembly having:

a simulated fuel bed;

a screen positioned behind the simulated fuel bed, the screen having a front surface adjacent to the simulated fuel bed;

at least one simulated interior fireplace wall positioned behind the screen;

a light source;

a flicker element positioned in a path of light from the light source to the screen for causing light from the light source to fluctuate, for providing the image of flames;

the front surface including:

a substantially translucent portion disposed proximate to the simulated fuel bed;

a substantially transparent portion disposed distal to the simulated fuel bed; and

a transition portion disposed betwe n the substantially translucent portion and the substantially transparent portion, the transition portion being partially translucent and partially transparent,

whereby the image of flames is at least partially viewable by the observer and said at least one simulated interior fireplace wall is positioned behind the image of flames and is viewable by the observer.

6. A flame simulating assembly according to claim 5 in which said at least one interior fireplace wall has a firebrick pattern thereon.

7. A flame simulating assembly according to claim 5 in which the substantially translucent portion of the front surface of the screen at least partially reflects an image of the simulated fuel bed.

8. A flame simulating assembly according to claim 7 additionally including a flame effect element, for configuring light from the light source to provide the image of flames which is projected onto the screen.

9. A flame simulating assembly including:

a substantially vertical back wall, a top wall, a bottom wall, and at least two side walls defining a cavity;

the cavity having an opening at a front side of the flame simulating assembly such that the cavity is substantially viewable from the front side by an observer;

at least one interior wall positioned substantially opposite to the opening, said at least one interior wall being adapted to simulate an interior of a fireplace;

a simulated fuel bed disposed in the cavity proximal to the opening;

a light source for providing an image of flames;

a scre n positioned behind the simulated fuel bed and in front of said at least one interior wall, the screen having a front surface positioned adjacent to the simulated fuel bed;

the screen being positioned in a path of light from the light source, to permit projection of the image of flames onto the screen;

the front surface of the screen including:

a substantially translucent portion disposed proximate to the simulated fuel bed;

a substantially transparent portion disposed distal to the simulated fuel bed; and

a transition portion disposed between the translucent portion and the transparent portion, the transition portion being partially translucent and partially transparent,

whereby the image of flames is at least partially viewable through the front surface of the screen and said at least one interior wall positioned behind the screen is viewable by the observer.

10. A flame simulating assembly for providing an image of flames viewable by an observer from a front side of the flame simulating assembly, the flame simulating assembly having:

a simulated fuel bed;

a light source adapted to provide the image of flames;

a screen positioned behind the simulated fuel bed and in a path of light from the light source, the screen having a front surface adjacent to the simulated fuel bed;

a simulated interior fireplace back wall positioned behind the screen;

at least two simulated interior fireplace side walls extending from the back wall forwardly, each of said at least two simulated interior

fireplace side walls having interior parts respectively positioned behind th screen;

the front surface of the screen including:

a substantially translucent portion disposed proximate to the simulated fuel bed;

a substantially transparent portion disposed distal to the simulated fuel bed; and

a transition portion disposed between the translucent portion and the transparent portion, the transition portion being partially translucent and partially transparent,

whereby the image of flames is at least partially viewable by the observer and the simulated interior fireplace back wall and the interior parts of said at least two side walls are at least partially viewable by the observer.

11. A flame simulating assembly for providing an image of flames viewable by an observer from a front side of the flame simulating assembly, the flame simulating assembly having:

a simulated fuel bed;

a light source adapted to provide the image of flames;

a screen positioned behind the simulated fuel bed and in a path of light from the light source, the screen having a front surface adjacent to the simulated fuel bed;

at least one simulated interior fireplace wall positioned behind the screen;

the front surface of the screen including:

a substantially translucent portion disposed proximate to the simulated fuel bed;

a substantially transparent portion disposed distal to the simulated fuel bed; and

a transition portion disposed between the translucent portion and the transparent portion, the transition portion being partially translucent and partially transparent,

whereby the image of flames is at least partially viewable by the observer and said at least one simulated interior fireplace wall positioned behind the screen is viewable by the observer.

12. A flame simulating assembly according to claim 11 in which said at least one simulated interior fireplace wall has a pattern simulating firebrick thereon.

13. A flame simulating assembly according to claim 12 in which said at least one simulated interior fireplace wall is a back wall and additionally including at least two simulated interior fireplace side walls, each of said at least two simulated interior fireplace side walls extending from said back wall forwardly beyond the front surface of the screen, said at least two simulated interior fireplace side walls having patterns simulating firebrick thereon.

14. A flame simulating assembly having a front side opening into a cavity therein, the flame simulating assembly being adapted for use with a simulated fuel bed located proximate to the front side, the flame simulating assembly having:

a light source for providing an image of flames;

a screen positioned in the cavity;

the screen having a front surface proximate to the simulated fuel bed;

the screen being positioned in a path of light from the light source such that the image of flames is projected onto the screen;

at least one simulated interior fireplace wall positioned in the cavity behind the screen;

the front surface of the screen including:

a substantially translucent portion dispos d proximate to the simulated fuel bed such that the image of flames is at least partially viewable through the substantially translucent portion;

a substantially transparent portion disposed distal to the simulated fuel bed such that said at least one simulated interior fireplace wall is viewable from the front of the cavity; and

a transition portion disposed between the translucent portion and the transparent portion, the transition portion being at least partially translucent and at least partially transparent, such that the image of flames and said at least one simulated interior fireplace wall are at least partially viewable therethrough.

15. A flame simulating assembly according to claim 14 in which the screen additionally includes a back surface positioned opposite to the front surface, the back surface being adapted to diffuse the image of flames projected thereon.

16. A flame simulating assembly according to claim 15 additionally including a flicker element positioned in a path of light from the light source for causing light from the light source to fluctuate, resulting in a fluctuating image of flames.

17. A flame simulating assembly according to claim 16 additionally including a flame effect element for configuring the fluctuating light to provide the fluctuating image of flames.

18. A flame simulating assembly according to claim 17 in which th substantially translucent portion of the front surface of the screen at least partially reflect an imag of th simulated fuel bed.

19. A flame simulating assembly according to claim 14 in which said at least one simulated interior fireplace wall has a pattern simulating firebrick thereon.

20. A flame simulating assembly according to claim 19 additionally including at least two simulated interior fireplace side walls, each of said at least two simulated interior side walls extending from said at least one simulated interior fireplace wall forwardly beyond the screen.

21. A flame simulating assembly for providing an image of flames viewable by an observer from a front side of the flame simulating assembly, the flame simulating assembly having:

a simulated fuel bed;

a light source for providing the image of flames;

a screen positioned behind the simulated fuel bed, the screen having a front surface adjacent to the simulated fuel bed;

the screen being positioned in a path of light from the light source, such that the image of flames is projected onto the screen and is viewable by the observer;

at least one simulated interior fireplace wall positioned behind the screen;

the front surface of the screen including:

a substantially translucent portion disposed proximate to the simulated fuel bed such that the image of flames is partially viewable through said substantially translucent portion;

a substantially transparent portion disposed distal to the simulated fuel bed such that said at least one simulated interior fireplace wall is viewable by the observer; and

a transition portion;

the translucent portion and the transition portion being produced by the steps of:

providing a source of vaporized metal adapted for spraying vaporized metal onto the front surface, such that the metal condenses thereon;

providing a mask element configured to substantially prevent vaporized metal sprayed from the source from condensing upon the transparent portion of the front surface;

positioning the mask element in a predetermined mask position relative to the source and the front surface of the screen;

positioning the source in a predetermined source position relative to the mask element and the front surface, such that vaporized metal is sprayable from the source onto the translucent portion and the transition portion of the front surface; and

spraying vaporized metal from the source onto the front surface.

22. A screen for use in a flame simulating assembly adapted for providing an image of flames, the flame simulating assembly including a simulated fuel bed, a light source for providing the image of flames, and at least one simulated interior fireplace wall positioned behind the screen, the screen having:

a front surface adjacent to the simulated fuel bed, the screen being positioned behind the simulated fuel bed;

the screen being positioned in a path of light from the light source, such that the image of flames is projected onto the screen and is viewable by the observer;

the front surface of the screen including:

a substantially translucent portion disposed proximate to the simulated fuel bed such that the image of flames is partially viewable through said substantially translucent portion;

a substantially transparent portion disposed distal to the simulated fuel bed such that said at least one simulated interior fireplace wall is viewable by the observer; and

a transition portion;

the translucent portion and the transition portion being produced by the steps of:

providing a source of vaporized metal adapted for spraying vaporized metal onto the front surface, such that the metal condenses thereon;

providing a mask element configured to substantially prevent vaporized metal sprayed from the source from condensing upon the transparent portion of the front surface;

positioning the mask element in a predetermined mask position relative to the source and the front surface of the screen;

positioning the source in a predetermined source position relative to the mask element and the front surface, such that vaporized metal is sprayable from the source onto the translucent portion and the transition portion of the front surface; and

spraying vaporized metal from the source onto the front surface.

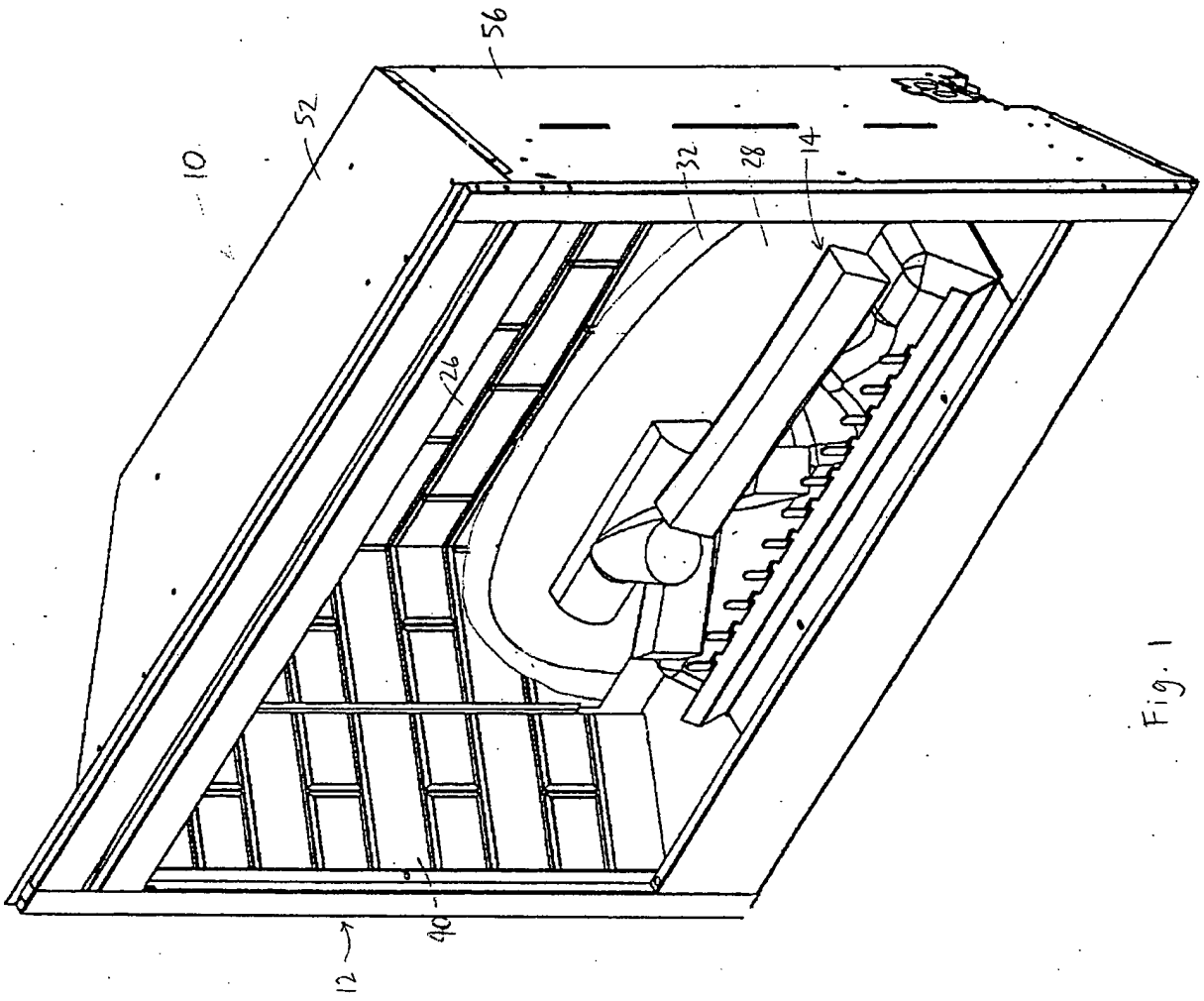

Fig. 1

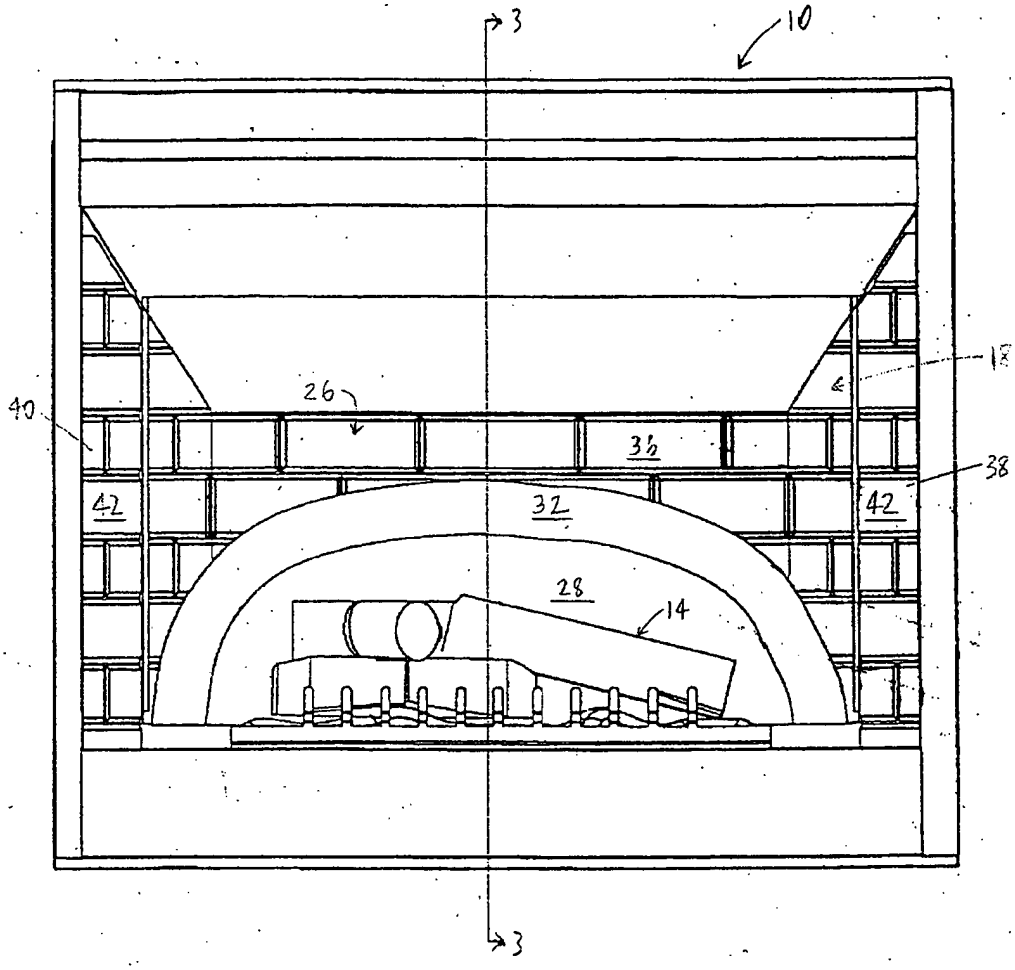

Fig. 2

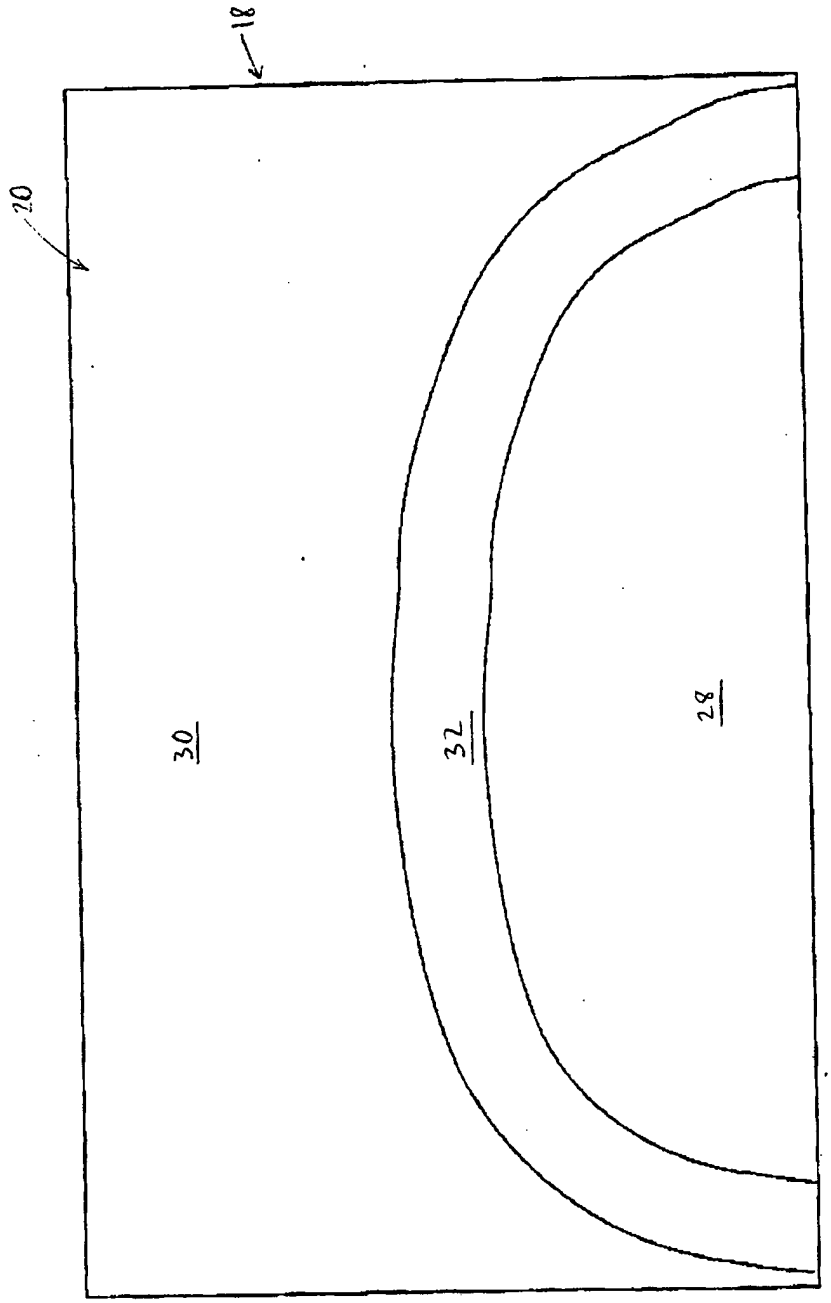

Fig. 2A

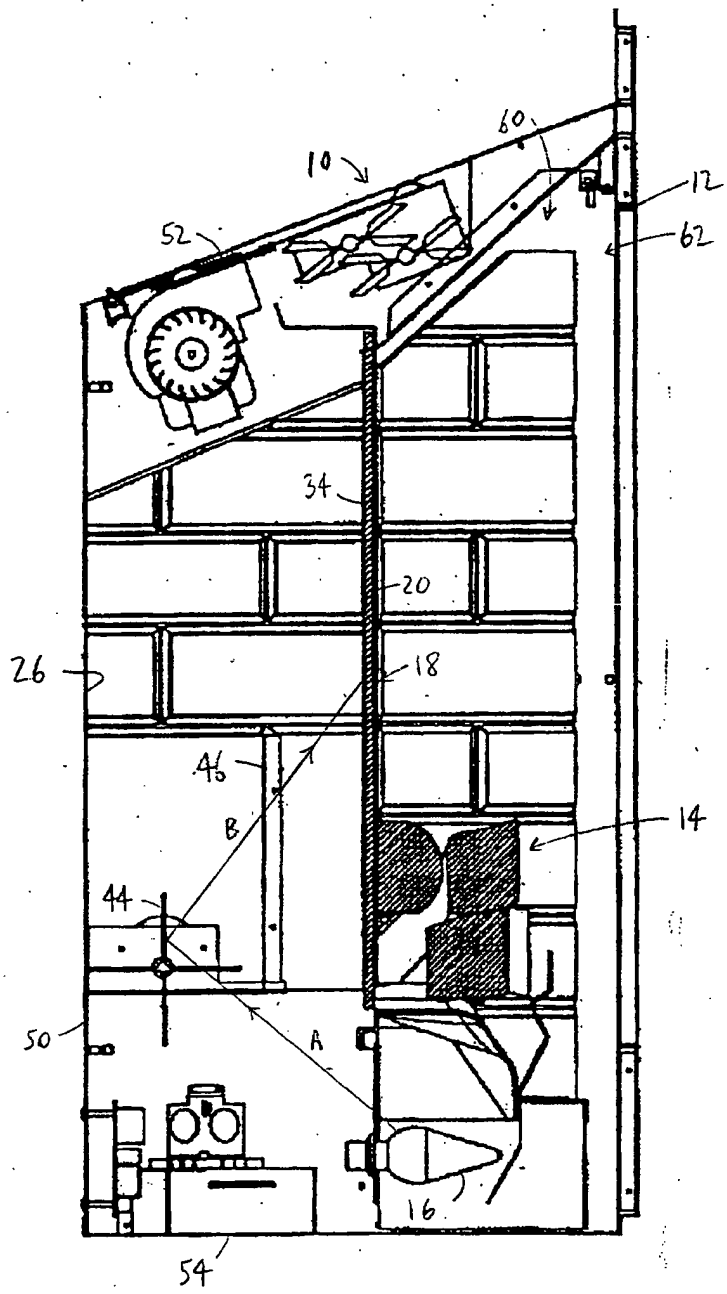

Fig. 3

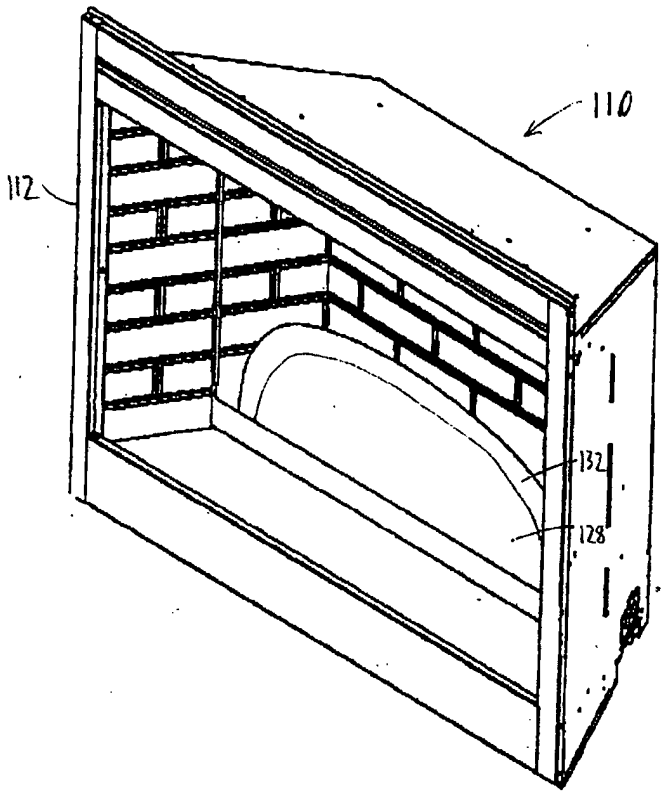

Fig. 4

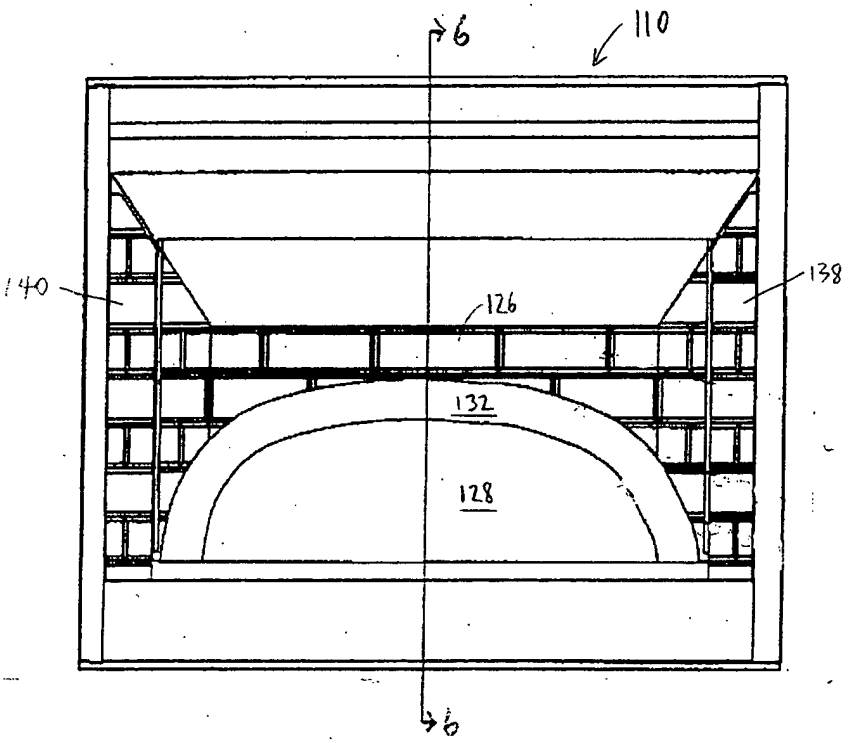

Fig. 5

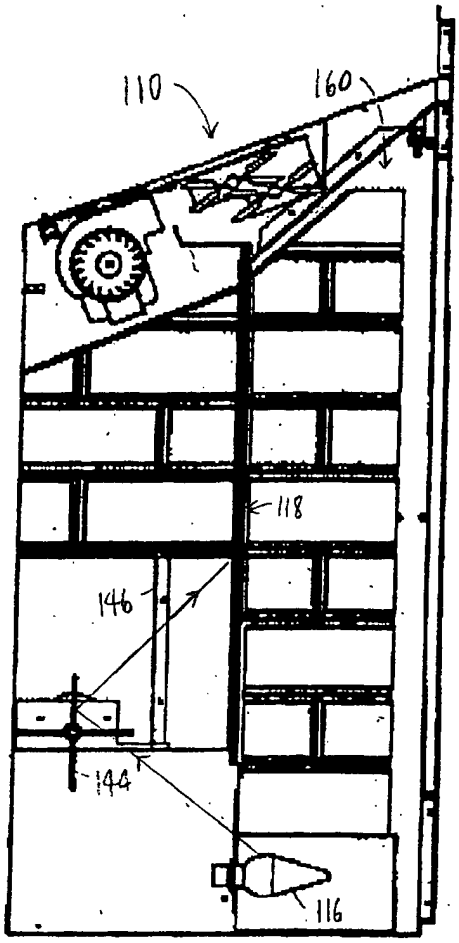

Fig. 6

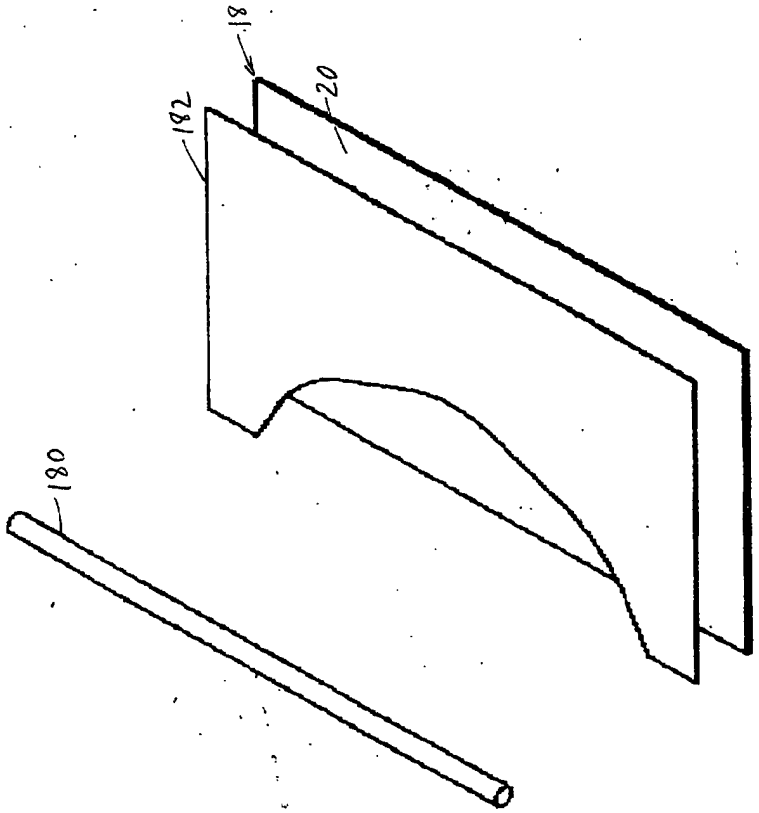

Fig. 7

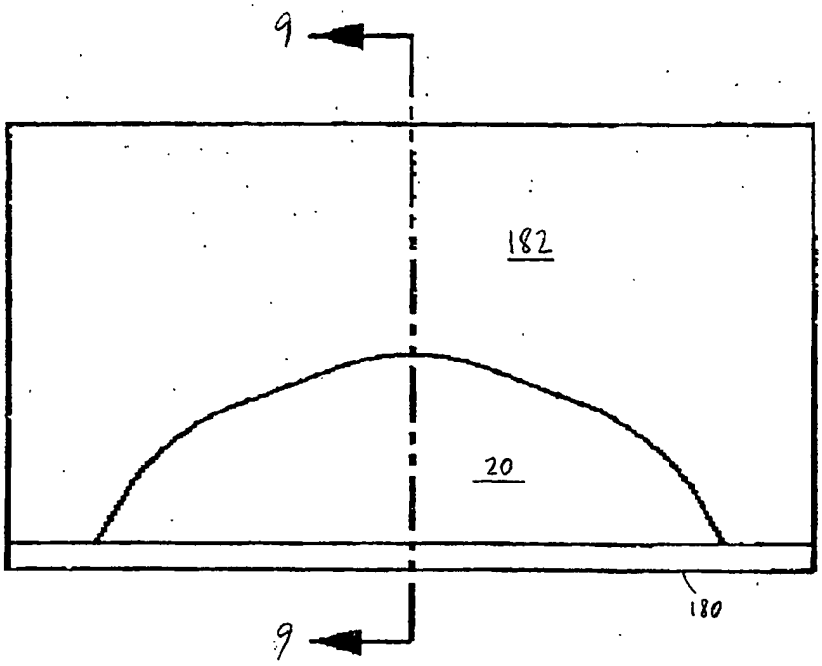

Fig. 8

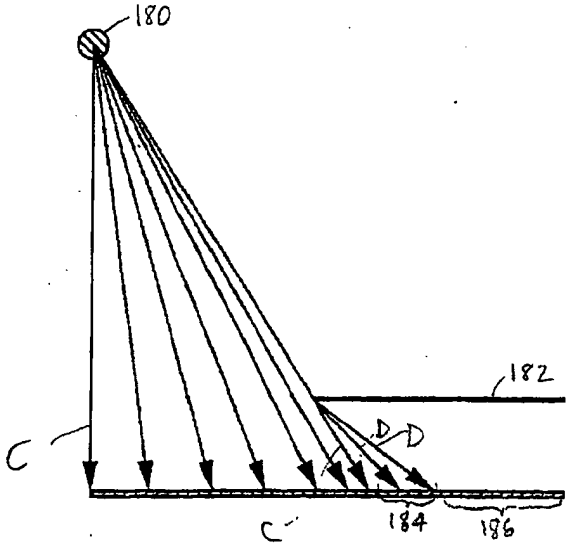

Fig. 9